REMARKS

Applicant appreciates the thorough examination of the present application that is reflected in the Office Action of August 11, 2006. However, Applicant respectfully submits that all of the pending claims are patentable for the reasons that will be explained below, and respectfully requests allowance of the pending application.

1. Claim Objections

Claim 5 was objected to in the Office Action. Claim 5 has been amended as suggested in the Office Action. Applicant appreciates the Examiner's action in bringing the error in Claim 5 to the Applicant's attention.

2. Claim Rejections - 35 USC § 102

The Office Action states that Claims 1-46 were rejected under 35 USC § 102(e) as anticipated by U.S. Patent No. 6,885,033 to Andrews ("Andrews") and U.S. Patent No. 6,893,892 to Gole et al ("Gole"). Office Action at 2. However, in the subsequent discussion, the Office Action applied Andrews against Claims 1-4, 6-9, 11-19, 23, 38-43 and 46. Office Action at 2-4. The Office Action applied Gole against Claims 10, 21, 22, 24, 44, and 45. Office Action at 3-4. The Office Action did not discuss claims 5, 20, 23 or 25-37 with respect to Gole or Andrews.

With respect to Claim 1, Applicant respectfully submits that Andrews does not teach etching a surface of a silicon carbide substrate using an aqueous etch to remove a damaged portion of the silicon carbide substrate resulting from processing of the silicon carbide substrate. While Andrews does teach forming a trench 22 in a SiC substrate by means of sawing and/or laser ablating the silicon carbide substrate, nowhere does Andrews mention etching the silicon carbide substrate, much less etching the silicon carbide substrate utilizing an aqueous etch to remove a damaged portion of the substrate resulting from formation of the trench. Indeed, the Office Action does not cite to any passage or figure of Andrews that discloses etching. Accordingly, Claim 1 is not anticipated by Andrews for at least these reasons.

With respect to Claim 38, Andrews does not disclose etching a silicon carbide substrate of the light emitting device using an aqueous etch to remove at least a portion of amorphous silicon carbide from a surface of the silicon carbide substrate of the light emitting device. Thus, Claim 38 is also not anticipated by Andrews for at least these reasons. Moreover, Applicant respectfully submits that Dependent Claims 2-9 and 39-46 are not anticipated by Andrews at least for the reasons set forth above.

With respect to Claims 11-19 and 23, which depend from Claim 10, Applicant submits that Andrews does not disclose etching a substrate of a light emitting device using an aqueous etch to at least partially remove a light absorption region of the substrate of the light emitting device. Accordingly, Applicant respectfully submits that Andrews does not anticipate Claims 11-19 and 23.

As noted above, Claims 10, 21, 22, 24, 44, and 45 were rejected as anticipated by Gole. Gole is directed to a photoluminescent sensor including a silicon substrate having a porous silicon region. See Gole, Abstract. Accordingly, Gole is not directed to a light emitting device. Nevertheless, in order to clarify some distinctions between Gole and the method of Claim 10, Claim 10 has been amended to recite a method of increasing light output of a light emitting *diode*.

Gole teaches electrochemically etching a portion of a silicon substrate to form a porous silicon region. See Gole, col. 20, ll. 42-45. According to Gole, the porous silicon region may have increased selectivity for sensing certain analytes. Gole, col. 19, ll. 2-5. However, Gole does not teach or suggest etching a substrate using an aqueous etch to at least partially remove a light absorption region of a substrate. That is, the etched region 19 of Gole is not a light absorption region of a light emitting diode. Rather, it is a photosensitive region that itself emits light in response to photonic excitation (i.e. in response to excitation by visible or ultraviolet light, see Gole, col. 1, ll. 30-33). Accordingly, Applicant respectfully submits that Claim 10 is not anticipated by Gole. Consequently, Claims 21 and 22, which depend from Claim 10, are also not anticipated by Gole.

Similarly, with respect to Claim 24, Gole does not disclose etching a substrate of a light emitting diode using an aqueous etch and using etching parameters that are sufficient to

increase an amount of light extracted through the substrate. Accordingly, Applicant respectfully submits that Claim 24 is not anticipated by Gole.

Claims 44 and 45 depend indirectly from Claim 38, which recites etching a silicon carbide substrate of a light emitting device using an aqueous etch to remove at least a portion of amorphous silicon carbide from a surface of the silicon carbide substrate of the light emitting device. As Gole does not disclose these recitations, Applicant respectfully submits that Gole does not anticipate Claims 44 and 45.

Claims 1, 10, 24 and 38 were rejected under 35 USC § 102(b) as anticipated by Pearton, S.J., "Wet and Dry Etching of SiC," Process Technology for Silicon Carbide Devices, pp. 85-92, Ch. 4 (2002) ("Pearton"). Applicant respectfully traverses this rejection.

In particular, Pearton generally discusses wet and dry etching of single crystal silicon carbide, which is noted for its hardness and resistance to etching. See Pearton, p. 85. Pearton notes that the hardness of SiC "makes it difficult to etch in typical acid or base solutions." Id. Table 4.1 of Pearton lists "typical molten salt solutions and the temperatures needed for successful etching of SiC." Id. As indicated in Table 4.1 of Pearton, a solution of KOH/KNO_3 requires a temperature of 350°C to successfully etch bulk 6H-SiC.

In contrast, the Applicant has discovered that processing of a silicon carbide layer, for example by sawing or lapping, may result in the formation of a light-absorbing damaged layer of SiC that may successfully be removed with an aqueous etch. In particular embodiments, the damaged layer, which may be amorphous, may be removed using an aqueous solution of $KOH:K_3Fe(CN)_6$ in relatively short times at relatively low temperatures compared to those typically required for wet etching of single crystalline SiC, as shown in Table 4.1 of Pearton.

The Office Action states that Pearton discloses, in Figures 4.3, 4.4, and 4.5 and pages 85-90, a method of fabricating a light emitting device including "etching the second surface of the SiC substrate utilizing an aqueous etch to remove a damage portion of the SiC substrate resulting from processing of the SiC substrate (see figure 4.5)." Office Action at 4-5. However, Applicant can find no teaching in Pearton of a light emitting device, much less a light emitting device having a SiC substrate with a damaged region resulting from processing of the substrate. Figure 4.5 of Pearton shows SEM micrographs of features etched into SiC substrates using SF_6 discharges, which is a dry etching technique, not an aqueous etch as

recited in Claim 1. Indeed, Figure 4.5 of Pearton is discussed in Section 4.3, which is entitled "Dry Etching." Furthermore, there is no indication that the material removed in the etched portions shown in Figure 4.5 of Pearton is a damaged region resulting from processing of the SiC substrate. Accordingly, Applicant respectfully submits that Claim 1 is not anticipated by Pearton.

Similarly, with respect to Claim 10, while Pearton generally discusses wet and dry etching of crystalline silicon carbide, Pearton does not disclose etching a substrate of a light emitting diode using an aqueous etch to at least partially remove a light absorption region of the substrate of the light emitting device. Likewise, with respect to Claim 24, Pearton does not disclose etching a substrate of a light emitting diode using an aqueous etch and using etching parameters that are sufficient to increase an amount of light extracted through the substrate.

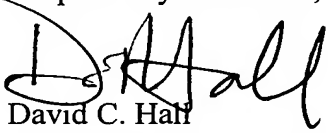
With respect to Claim 38, Pearton does not disclose etching a silicon carbide substrate of a light emitting device using an aqueous etch to remove at least a portion of amorphous silicon carbide from a surface of the silicon carbide substrate of the light emitting device.

Accordingly, Applicant respectfully submits that Pearton does not anticipate Claim 10, 24 or 38, and respectfully requests that these rejections be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that all of the pending claims are patentable, and respectfully request allowance of the pending application.

Respectfully submitted,



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